

# **Voter Verified Paper Audit Trails Update**

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# Overview

- Statistics on VVPAT Usage
- Current VVPAT systems
- Broadening VVPAT to non-DRE systems
- Ramifications to existing requirements
- VVPAT auditing
- Future directions for VVPAT in VVSG 2007

## VVPAT Stats

- 26 states have enacted legislation for paper trails, with 13 proposed
- For 2006, 40% of registered voters expected to use Op Scan equipment
- 38% to use DRE equipment
- VVPAT will be used in 5 states

# VVPAT Usage in 2006-2008

- Likely that the push for using paper will extend to more states
- More experience will be gained in using current VVPAT technology
- Feedback on the usability/accessibility for voters AND usability of auditing for election officials will be especially interesting to monitor

# Broadening VVPAT

- VVSG 2005 requirements are for DRE systems that provide VVPAT capability
- Other types of voting systems can provide VVPAT, however
- Important to focus on definition of VVPAT in the requirements
- Important for requirements to not restrain marketplace approaches solely to DRE

# EBM and Op Scan

- EBM produces a PAT
- Voter Verification of PAT is meaningful because
  - Under/Overvotes can be detected as per DRE
  - Voter knows essentially how it will be counted (as with DRE)
- The PAT is suitable for use in audits, recounts
- EBM and Op Scan much like CalTech-MIT “Frog” protocol

# Why Not Just Op Scan

- Do Manually-Marked Paper Ballots make an unambiguous AT?
  - Depends on how accurately they are marked and the accuracy of the scanner in detecting valid marks
- Are MMPB voter verified?
  - Voter can't determine whether MMPB was scanned "correctly"
  - Lack of under/overvote detection complicates further
- Some suggestions that Op Scan should
  - Store electronic record for each MMPB
  - Save an image of each MMPB
  - Present voter with a summary screen or
  - Print a paper record of each scanned MMPB

# Ramifications to VVSG 2005

- Few changes, no new requirements
- Some requirements need to be preceded by “For DRE systems, ...”
- E.g., For DRE systems, the paper and electronic records must be linked by a unique identifier

# Auditing of VVPAT

- NIST wrote short informative section on auditing
- Important that paper records be used against machine totals
- Bar codes require a 2-stage audit
- Focus should be on level of fraud detection desired as opposed to simple percentage of ballots to recount
- Real randomness in ballot selection a must
- Should bar codes be published along with corresponding votes?

# VVPAT in the VVSG 2007

- Requirements may still change because of interrelationships with other areas, e.g.,
  - Linking requirements to tests
  - Usability/Accessibility research
  - Electronic and paper record formats
  - Relationship to Independent Verification
- Requirements will permit wider range of approaches to providing VVPAT
- More focus on providing uniformly auditable approaches to VVPAT

# Open Issues to Research

- Bar codes – a good idea in general?
- Usability, privacy and paper spools
- Ease of auditing VVPAT records
- Common formats for all cast ballot records (e.g., EML)

## Discussion